

**EMSP****Environmental Management Science Program**

FACTS ON FILE

New Silicotitanate Waste Forms: Development and Characterization

Problem Area: High Level Waste

Scientific Category/Subcategory: Materials Science/Chemical and Structural Properties of Storage Materials

Description: Researchers at Pacific Northwest and Sandia National Laboratories and the University of California Davis are exploring alternative waste forms for crystalline silicotitanate ion exchangers once they have been loaded with radioactive Cs and Sr. Rather than dissolve this material into borosilicate glass which is very expensive and time consuming but the only accepted treatment for HLW, they have found in-situ heat treatment can produce a waste form significantly more stable and durable while greatly simplifying the required processing steps.

Application: The information and techniques developed from this project will be applicable to the Tanks Focus Area. Specific application is envisioned for the high level wastes at Idaho, Richland and Savannah River or wherever the crystalline silicotitanate ion exchangers might be employed to separate out these very radioactive ions from the aqueous tank wastes or process streams. This allows a larger fraction of the waste to be processed as low activity waste with resultant simplification and cost savings.

Value/Benefits: This process operates at lower temperatures (in the range of 800 to 1000 °C) than vitrification while still resulting in nearly 40% volume reduction. It is therefore less expensive and dramatically simplifies the required processing. Also improved durability ensures minimal long term environmental or health and safety risk from gradual release of radionuclides after placement in the final disposal repository.

Project Lead:

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Other Participating Institutions:

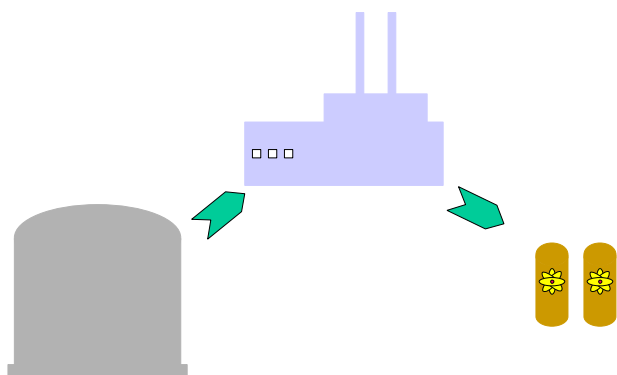
Sandia National Laboratories
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Project Duration:

1997-2000

Web Information Sources:

<http://www.doe.gov/html/em52/60345.html>



The Environmental Management Science Program (EMSP) is funding basic research projects focused on solving the most difficult problems that threaten the closure plans of DOE sites. Further program information can be found at this web site: <http://emsp.em.doe.gov/>